

Amendments to the Drawings:

The attached sheets of drawings include changes to Figures 2 and 4. Calculating means 231 and Computer 233 have been added.

REMARKS/ARGUMENTS

I. Objections to the Drawings

The drawings are objected for failing to show the laser trimmed wafer resistors, the computer, and the calculating means. The laser trimmed wafer resistors are shown in the original drawings at reference numbers 310 and 315 in Fig. 3. The drawings are amended to show the computer and the calculating means. Support in the specification is at page 8, line 12. Figs. 2 and 4 are amended to show the computer at reference number 233. Support in the specification is at page 10, lines 28-30. Figs. 2 and 4 are also amended to show the calculating means at reference number 231. Support in the specification is at page 10, lines 25-28 and page 13, line 17.

II. Amendments to the Specification

The specification is amended at page 10 to add the reference numbers for the calculating means and computer. The specification is amended at page 11 to correct a typo, i.e., replacing “an” with “and”.

III. Claim Objections

The phrase “and mixtures thereof” in claims 1, 15, and 26 is objected to. The claims are amended to delete this phrase.

IV. Section 112 – Written Description Rejection

Claims 1-49 are rejected as failing to comply with the written description requirement. The claim language in question is “wherein the power supply derives its power from the

plurality of cells.” The rejection is respectfully traversed. Optional Power Supply 240 is shown in Fig. 2 with a connection to Cell Stack 11. The power supply is discussed in the specification at page 12, line 31 to page 13, line 4. Also, the language “wherein the power supply derives its power from the plurality of cells” is supported at page 5, lines 23-26 of the specification.

Additionally, the claims are amended to be limited to fuel cells. Where the Cell Stack 11 consists of fuel cells rather than battery cells, the Power Supply 240 would simply be another load on the Cell Stack 11 in addition to its primary load, e.g., an electric motor for an automobile.

The distinction from prior art’s discrete components versus the advantages of the instant invention’s integral power supply is discussed in the specification at page 4, lines 17-22 in reference to U.S. Patent No. 5,914,606.

V. Section 103 – Obviousness Rejection

Claims 1-8 are rejected over Masse in view of James. The rejection is respectfully traversed. As noted, Masse does not teach laser wafer trimmed resistors, an A/D converter monitoring 16 cells, and an integral power supply.

Masse addresses the problem of ‘residual error’ and ‘common-mode voltage error’ and requires calibration. See Masse at:

- “In practice, the fuel cell voltage monitoring system 10 requires calibration in order to obtain accurate voltage measurements.” Paragraph 0055, lines 1-3.

- “In addition, due to unavoidable internal mismatches in the differential amplifier, an extraneous voltage occurs at the output . . .” Paragraph 0056, lines 1-3.
- “Due to the common-mode voltage error . . . the output of the differential amplifier will deviate from the actual cell voltage of the fuel cell. This deviation is referred to as a residual voltage which a measure that cannot be eliminated with common differential amplifier arrangements.” Paragraph 0058, lines 1-4.
- “The above problem can be overcome if the measured cell voltage of the fuel cell is calculated based on a linear equation which uses the digital values obtained from the voltage measurement of each fuel cell. In order to perform the calculation, at least one voltmeter and a calibrator (both are not shown) are needed for reading voltage values during a calibration process. Preferably, the voltmeter is a high precision voltmeter.” Paragraph 0059, lines 1-4.
- “Referring now to Fig. 3b, the measurement error can be eliminated by calibrating the differential amplifier 66 with a calibrator 70 . . .” Paragraph 0071, lines 1-3.
- See Calibrator 70 in Fig. 3b.

In contrast, the instant invention does not require calibration to obtain a high accuracy. Thus, Masse recognizes a problem with accurate measurement of fuel cell having a high common mode voltage and teaches residual voltage error is unavoidable and requires additional calibration circuitry and steps to correct for. Thus, Masse teaches away from

the instant invention's overcoming of the problem via laser trimmed wafer resistors. A reference which teaches away cannot be a basis for obviousness. *See In re Irmischer*, 120 USPQ 196 (C.C.P.A. 1958), *Radio Steel v. MTD Products*, 221 USPQ 675 (Fed. Cir. 1984). Masse teaches its invention as solving a need for an inexpensive and highly precise CVM (Para. 0075, lines 1-8), yet requires a calibration component and step.

There is no motivation to combine the James and Masse to include an integral power supply in a fuel cell voltage monitoring system including one where the power supplies are powered by the fuel cells. James does not show the voltage regulators 26 (James in Fig. 1) as being integral with a self-contained cell voltage monitor.

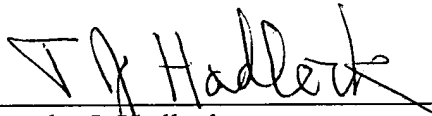
Regarding claims 9 – 49, the Examiner has made brief comments regarding these claims in the Office Action section relating to section 103 objections. Since the section 103 rejection is only made for claims 1-8, Applicant need not address claims 9 - 49 in detail at this time. Briefly, Masse does not teach a single housed unit as recited in, e.g., instant claims 26(f) and 15(f). The reference to Masse at paragraph 4, in the background section, discusses a fuel cell module and its housing and does not teach a cell voltage monitor in a single housing. Also, Masse does not teach aggregating multiple modules. See instant claims 10 and 16.

VI. Conclusion

From the foregoing, it is submitted that Applicants' claims as amended define subject matter that is novel and nonobvious. Claims 3, 4, 18, 19, 39, and 40 are cancelled. Claims 1, 2, 5-17, 20-38, and 41-49 as amended are pending. Accordingly, allowance of claims 1, 2, 5-17, 20-38, and 41-49 is requested.

Respectfully submitted,
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By: _____


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Attachment: Replacement Sheets